



Building Army Operational Energy Capabilities

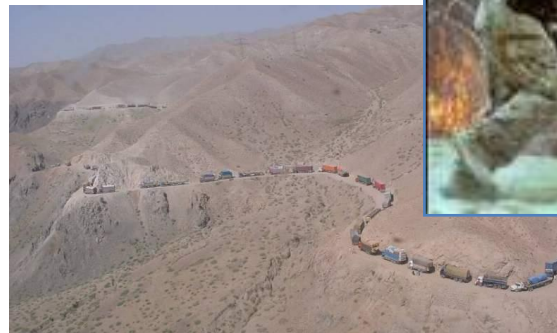
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The future . . .

- Dynamic, unpredictable situations
- Varying levels of violence
- Stability and assistance aspects
- Diverse actors
- Asymmetric threats
- Adaptive enemies
- Distributed operations
- Extended supply lines

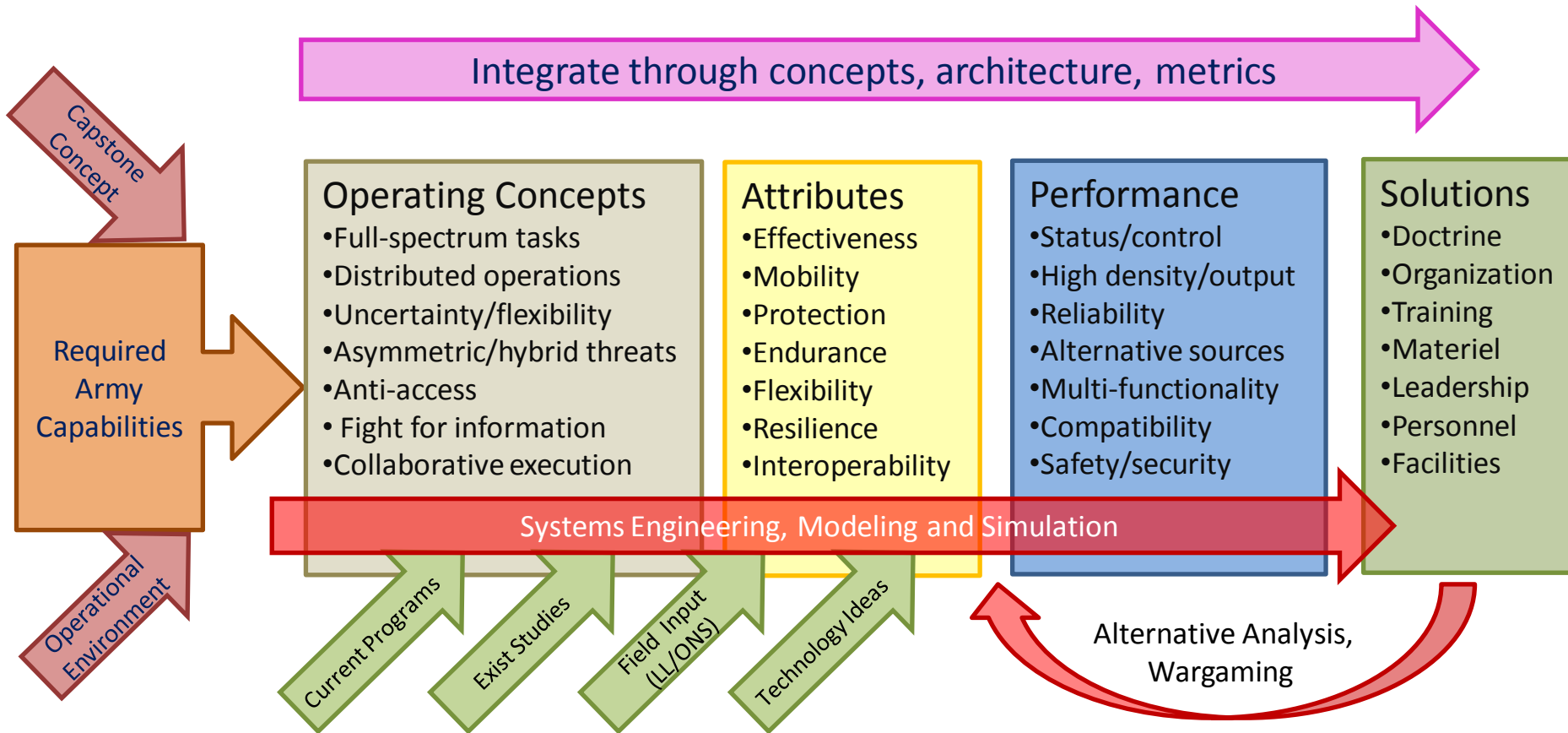


The need . . .

Build a ground force capable of deploying worldwide, using an integrated full-spectrum suite of effects to execute a range of missions as required to support national security objectives.



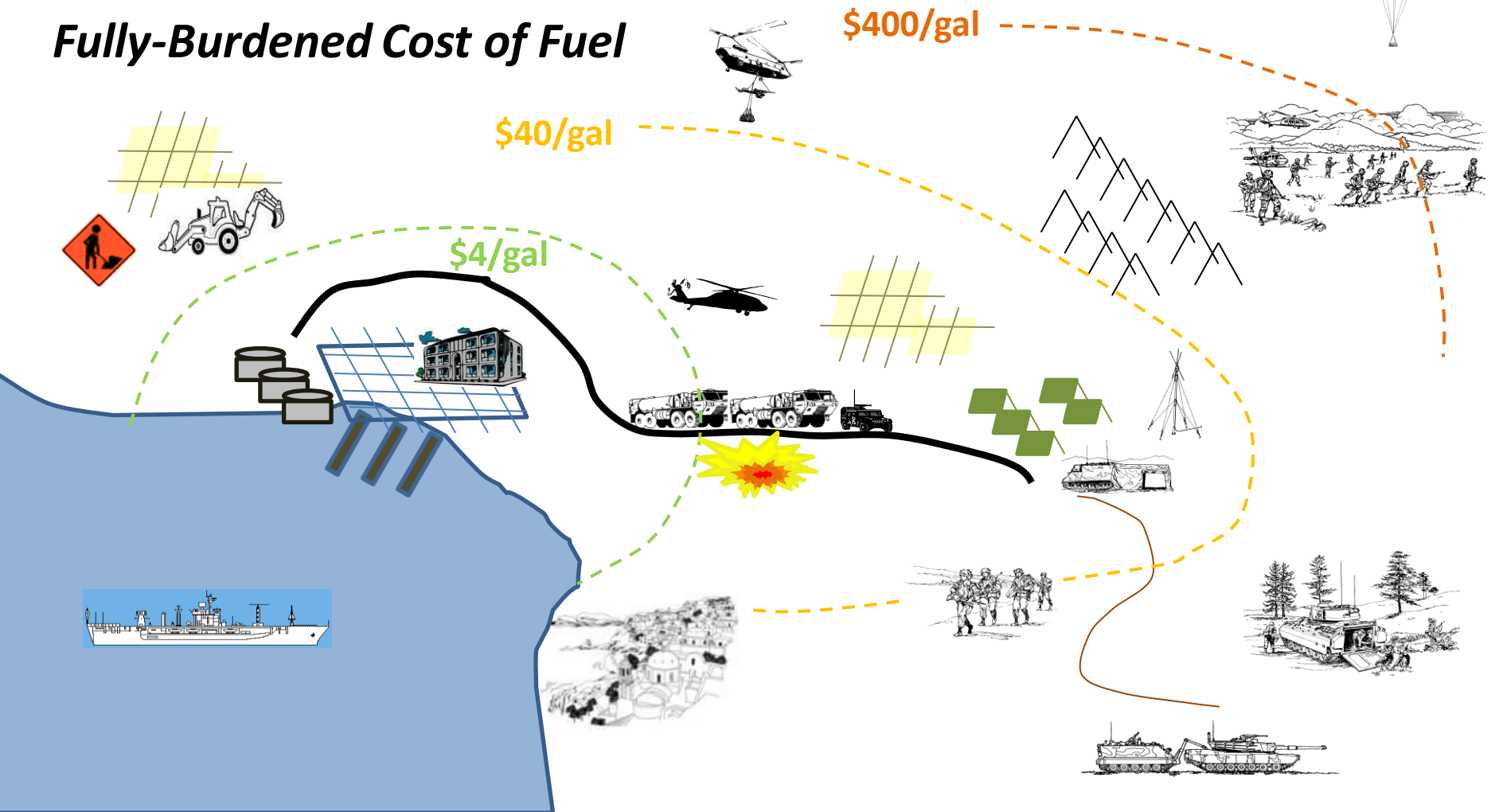
Operational Energy Capability Development





Example Analysis Metric

Fully-Burdened Cost of Fuel



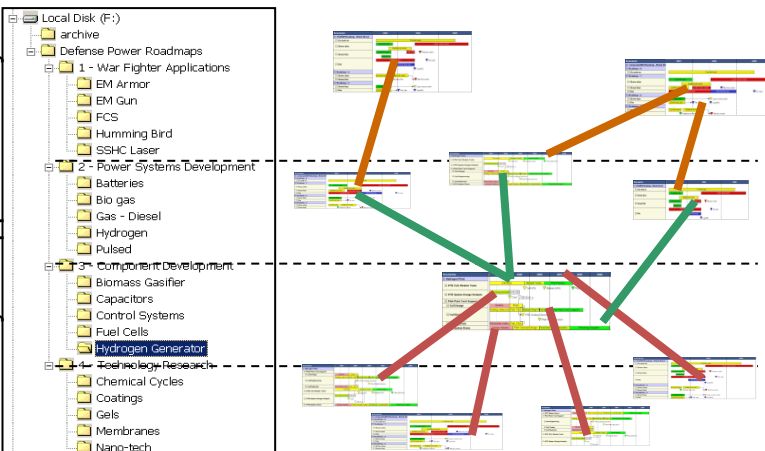
*Illustrative Purposes only – numbers unique to situation
Total cost/effort increases with distance, effort, risk*



Integration Concept

- More than logistics or a “better battery”
- Greatest gains through system and operational integration

Hierarchy of Application Layers



“Layered” Energy Architecture

Mission Integration/Energy-Informed Operations

- Awareness/understanding – CONOPS, systems analysis
- Planning tools – mission planning, sustainment planning, support architecture
- Execution integration – decision aids, measures of effectiveness

Energy/Power/Water Management

- Monitoring/SA – meters, sensors, metrics, visualization
- Power management – manual or automated
- Demand reduction – control, discipline, recycling

Hardware/Software System Integration

- Shared components
- Design optimization – synergies, trades
- Networks/“smart grids”

Energy Technology

- Storage – tankage, batteries, capacitors
- Conversion – engines, fuel cells, generators
- Delivery – pumps, distribution infrastructure, rechargers, pulsed power
- Use – air conditioners, water production, transportation, computers

Energy Source

- Logistics fuel
- Renewables/waste-to-energy
- Local grid
- Nuclear